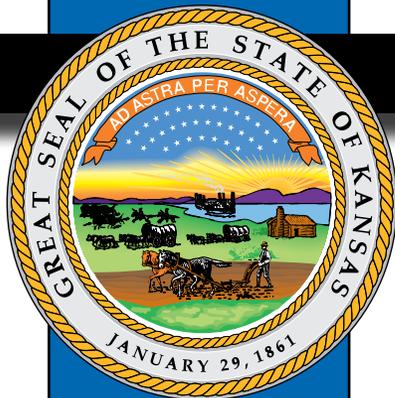


2007

FLOODPLAIN MANAGEMENT IN KANSAS



QUICK GUIDE

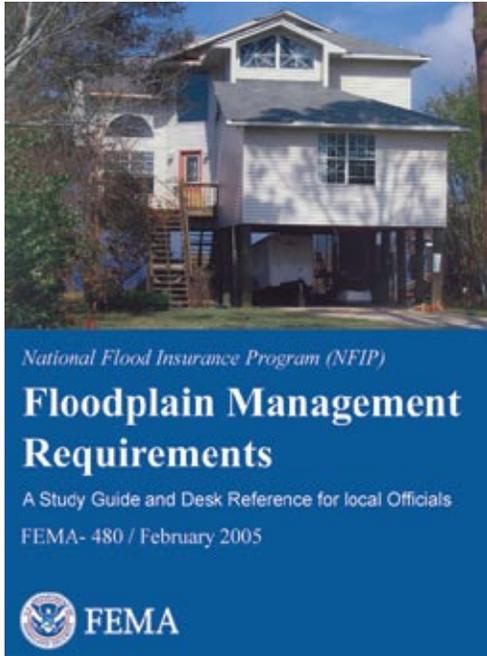
KANSAS DEPARTMENT OF
AGRICULTURE

<http://www.ksda.gov>

Table of Contents

- 1.....About this Guide
- 2.....Introduction
- 3.....Useful Resources
- 4.....Selected Definitions
- 7.....Flood Zones
- 8.....Community Responsibilities
- 9.....Understanding the Riverine Floodplain
- 10.....Understanding the Floodway
- 11.....The Flood Insurance Rate Map
- 12.....The Countywide Flood Insurance Rate Map
- 13.....Use the Riverine Flood Profile to Determine BFEs
- 14.....Approximate Flood Zone or Unnumbered Zone A
- 15.....Letter of Map Change (LOMC)
- 16.....What do Pre-FIRM and Post-FIRM Mean?
- 17.....Nature Doesn't Read Maps!
- 18.....Safe Uses of the Floodplain
- 19.....Some Activities Requiring Floodplain Development Permits
- 20.....Some Key Steps in Floodplain Development Permit Review
- 21.....Carefully Complete the Permit Application
- 22.....Think Carefully Before Issuing a Variance
- 23.....Floodplain Fill Can Make Things Worse
- 24.....The Floodway "No-Rise " Certification
- 25.....What is an Elevation Certificate and How is it Used?
- 26.....Completing the Elevation Certificate
- 27.....Is Your Building Site Higher than the BFE?
- 28.....Paperwork is Important for You and Your Community
- 29.....Basements in Special Flood Hazard Areas
- 30.....How to Elevate Your Floodplain Structure
- 31.....Compaction of Floodplain Fill
- 32.....Elevating A Pre-FIRM Structure
- 33.....Enclosures Below BFE
- 34.....Manufactured Homes Deserve Special Attention
- 35.....Utility Service / Fuel Tanks
- 36.....Accessory (Appurtenant) Structures
- 37.....Agricultural Structures
- 38.....Recreational Vehicles
- 39.....Small Berms and Floodwalls Can Protect Pre-FIRM Structures
- 40.....Planning to Improve Your Floodplain Structure
- 41.....What About After Damage?
- 42.....Residential Substantial Damage Estimator
- 43.....Paying for Post-Flood Compliance - ICC
- 44.....Repetitive Loss Eligibility under ICC
- 46.....Flood-prone Property Acquisition Projects
- 47.....Flood Insurance is Your Best Protection
- 48.....Freeboard: Go an Extra Foot - Save Money!
- 49.....Want to Learn More?

About this Guide



The floodplain management *Quick Guide* was originally prepared by our friends and neighbors in Missouri, Alabama, Illinois and Mississippi. These states have graciously allowed it to be edited and modified for use in Kansas. Copyright laws do not apply.

The development of this *Quick Guide* was supported by funding through the Federal Emergency Management Agency as part of the Community Assistance Program - State Support Services Element of the NFIP.

Questions and comments and requests for additional copies should be directed to the Kansas Department of Agriculture, Division of Water Resources National Flood Insurance Program (NFIP) State Coordinator at 785-296-5440. We encourage any comments and suggestions for improvements to this guide.

For more detail on all aspects of floodplain management, please refer to the FEMA National Flood Insurance Program Floodplain Management Requirements Study Guide and Desk Reference for Local Officials.

The Kansas Department of Agriculture, Division of Water Resources is pleased to provide this floodplain management **Quick Guide** informational tool to community officials.

We regulate the floodplain to:

To protect people and property. Floodplain management is about reducing vulnerability to flood risk to our built environment. If we know low lying land will flood from time to time, we should make reasonable decisions to help protect our families, homes, and businesses.

To make sure that federal flood insurance is available. If your home or business is in the floodplain and federal flood insurance isn't available you may not be eligible for some federal business loans and grants or for some types of federal financial assistance. Mortgages may be hard to find.

To save tax dollars. Every time you hear about a flood disaster, think about what it means to the town's budget. If we build smart, we'll have fewer problems the next time the river rises. Remember, federal disaster assistance doesn't kick in for all floods. And even when the President declares a disaster, your community still has to pay a portion of repair and clean up costs and could also incur some evacuation expenses.

To avoid liability and law suits. If we know an area is mapped as a floodplain and likely to flood and we know people could be in danger and buildings damaged, doesn't it make sense to take reasonable protective steps as we develop and build?

To reduce future flood losses in Kansas. Floodplain development regulations are simply a "good neighbor" policy designed to protect our citizens from future flood losses. Regulating floodplain development helps keep flooding conditions from getting worse as development continues.

Common Acronyms

BFE – Base Flood Elevation
CLOMA – Conditional Letter of Map Amendment
CLOMR – Conditional Letter of Map Revision
CLOMR-F – Conditional Letter of Map Revision based on Fill
CRS – Community Rating System
EC – Elevation Certificate
FEMA – Federal Emergency Management Agency
FHBM – Flood Hazard Boundary Map
FIRM – Flood Insurance Rate Map
FIS – Flood Insurance Study
HMGP – Hazard Mitigation Grant Program
ICC - Increased Cost of Compliance
KAFM – Kansas Association for Floodplain Management
KDA / DWR – Kansas Department of Agriculture
Division of Water Resources
LOMA – Letter of Map Amendment
LOMC – Letter of Map Change
LOMR – Letter of Map Revision
LOMR-F – Letter of Map Revision based on Fill
NFIP – National Flood Insurance Program
SFHA – Special Flood Hazard Area

Internet Links

Family Disaster Planning
<http://www.redcross.org/services/disaster>

Repairing Your Flooded Home, ARC and FEMA
<http://www.fema.gov/rebuild/recover/resources.shtm>

Kansas Department of Agriculture
Division of Water Resources, Floodplain Program
<http://www.ksda.gov>

NFIP Publications
<http://www.fema.gov/business/nfip/libfacts.shtm>

FEMA NFIP Floodplain Management Requirements
A Study Guide and Desk Reference for Local Officials
http://www.floods.org/Certification/FEMA_480.asp

FEMA Elevation Certificate
<http://www.fema.gov/business/nfip/forms.shtm>.

Information on ICC
<http://www.fema.gov/plan/prevent/floodplain/ICC.shtm>

Selected Definitions

Base Flood – A term used in the FEMA National Flood Insurance Program (NFIP) to indicate the minimum size flood to be used by a community as a basis for its floodplain management regulations; presently required by regulation to be that flood which has a one-percent annual chance of being equaled or exceeded in any given year. Also known as a 100-Year Flood or One-Percent Annual Chance Flood.

Base Flood Elevation (BFE) – (1) The height in relation to mean sea level (MSL) expected to be reached by the waters of the Base Flood at specific points in the floodplain of Riverine areas. (2) The elevation for which there is a one-percent chance in any given year that flood levels will equal or exceed it. (3) The elevation shown on the Flood Insurance Rate Map (FIRM) for Zones AE, AH, A1-A30, AR, AR/A, AR/AE, AR/A1-A30, AR/AH and AR/AO that indicates the water surface elevation resulting from a flood that has a one-percent or greater chance of being equaled or exceeded in any given year. The BFE is generally based on statistical analysis of stream flow records for the watershed and rainfall and runoff characteristics in the general region of the watershed, and application of hydraulic backwater models.

Special Flood Hazard Area (SFHA) – is the portion of the floodplain subject to inundation by the base flood and/or flood related erosion hazards. SFHAs are shown on FHBMs or FIRMs as Zones A, AE, A1-30, AH, AO, and AR.

Regulatory Floodway – The stream channel plus that portion of the overbanks that must be kept free from encroachment in order to discharge the one-percent annual chance flood without increasing flood levels by more than 1.0 foot.

Selected Definitions (continued)

Substantial Damage – Damage of any origin sustained by a structure whereby the cost of restoring the structure to its “before damaged” condition would equal or exceed 50 percent of the market value of the structure before the damage occurred. All structures that are determined to be substantially damaged are automatically considered to be substantial improvements, regardless of the actual repair work performed. If the cost necessary to fully repair the structure to its “before damaged” condition is equal to or greater than 50% of the structure’s market value before damages, then the structure must be elevated (or floodproofed if it is non-residential) one foot above the Base Flood Elevation (BFE), and meet other applicable NFIP requirements.

Substantial Improvement – Any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the “start of construction” of the improvement. This term includes structures which have incurred “substantial damage,” regardless of the actual repair work performed. The term does not, however, include either:

1. Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions or
2. Any alterations of a “historic structure,” provided that the alteration will not preclude the structure’s continued designation as a “historic structure.”

Floodplain management requirements for new construction apply to substantial improvements. Increased Cost of Compliance (ICC) coverage does not apply to substantial improvements unless a structure is substantially damaged due to flooding.

Selected Definitions (continued)

Flood Insurance Rate Map (FIRM) – The FIRM is the basis for floodplain management, mitigation, and insurance activities for the National Flood Insurance Program (NFIP). Insurance applications include enforcement of the mandatory purchase requirement of the Flood Disaster Protection Act which “...requires the purchase of flood insurance by property owners who are being assisted by Federal programs or by Federally supervised, regulated or insured agencies or institutions in the acquisition or improvement of land facilities located or to be located in identified areas having special flood hazards” (Section 2 (b) (4) of the 1973 Flood Disaster Protection Act). In addition to the identification of Special Flood Hazard Areas, the risk zones shown on the FIRMs are the basis for the establishment of premium rates for flood coverage offered through the NFIP.

Freeboard – Freeboard means a factor of safety usually expressed in feet above a flood level for purposes of floodplain management. “Freeboard” tends to compensate for the many unknown factors that could contribute to flood heights greater than the height calculated for a selected size flood and floodway conditions, such as wave action, bridge openings, and the hydrological effect of urbanization of the watershed.

Variance – A grant of relief by a community from the terms of a floodplain management regulation. Because a variance can create an increased risk to life and property, variances from flood elevation or other requirements in the flood ordinance should be rare. Insurance premium rates are required by statute to be based on actuarial risk and will not be modified by the granting of a variance. Specific criteria for granting a variance is described in the supplemental information.

FEMA may review a community’s findings justifying the granting of variances, and if that review indicates a pattern inconsistent with the objectives of sound floodplain management, FEMA may take appropriate action up to and including suspending the community from the NFIP.

Reasonably Safe from Flooding – Base flood waters will not inundate the land or damage structures to be removed from the SFHA and that any subsurface waters related to the base flood will not damage existing or proposed buildings.

Flood Zones

Flood zones are geographic areas that the Federal Emergency Management Agency (FEMA) has defined according to varying levels of flood risk. These zones are depicted on a community's Flood Hazard Boundary Map (FHBM) or Flood Insurance Rate Map (FIRM). Each zone reflects the severity or type of flooding in the area.

Undetermined Risk Areas: Zone D -- Flood insurance available to all property owners and renters. Unstudied areas of undetermined but possible flood hazards. Lenders do not require flood insurance purchase. Base flood elevations not available.

Moderate to Low Risk Areas: Zones B, C, and X -- Lower-cost flood insurance available to all property owners and renters. Areas located outside the 1% annual chance floodplain (100-year floodplain). Includes areas protected from flood by certified 100-year levees. Lenders do not require flood insurance purchase. Area is higher than base flood elevation.

High Risk Areas: Flood insurance available to all property owners and renters. Lenders require mandatory purchase of flood insurance in all flood zones that begin with the letter A.

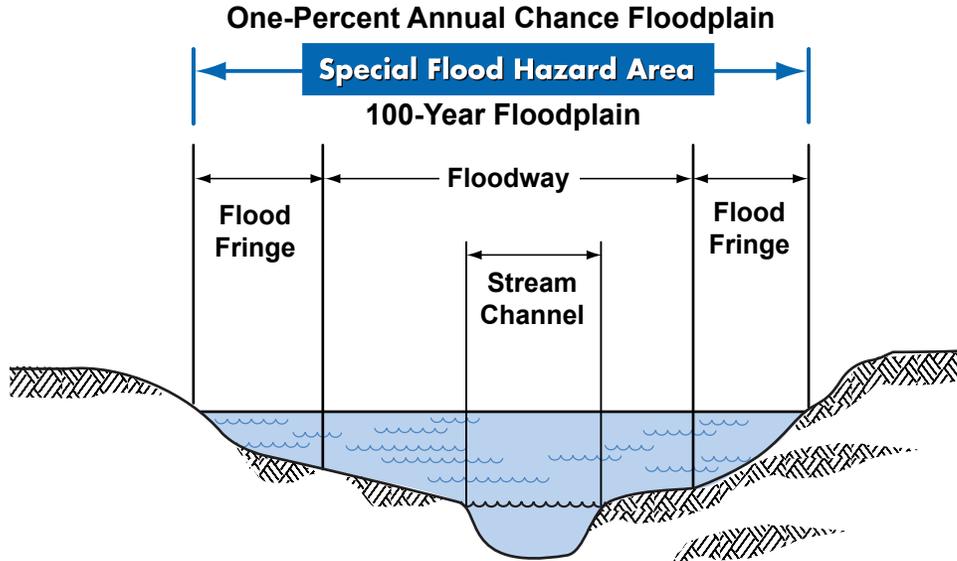
- Zone A – Areas with a 1% or greater annual chance of flooding (100-year floodplain). Hydraulic analyses not performed. Base flood elevations not shown.
- Zone AE – Areas with a 1% or greater annual chance of flooding (100-year floodplain). Hydraulic analyses performed. Base flood elevations shown.
- Zone AH – Areas with a 1% or greater annual chance of shallow flooding (ponding) with an average depth of 1 to 3 feet. Hydraulic analyses performed. Base flood elevations shown.
- Zone AO – Areas with a 1% or greater annual chance of shallow flooding (sheetflow), with an average depth of 1 to 3 feet. Hydraulic analyses performed. Base flood elevations shown.
- Zone AR – Areas with a 1% or greater annual chance of flooding protected behind a decertified levee, which is in the process of being reconstructed to restore 100-year flood protection.

Community Responsibilities

To participate in the National Flood Insurance Program, your community agrees to:

- **Adopt and enforce** a floodplain management ordinance
- **Require** permits for all types of development in the floodplain (see page 19)
- **Require** elevation certification to document compliance (see pages 25 and 26)
- **Require** new or improved residential structures and manufactured homes to be elevated to one foot above the BFE
- **Require** non-residential structures to be elevated to one foot above the BFE or floodproofed
- **Conduct** field inspections and cite any violations to the community's Floodplain Management Ordinance
- **Ensure** that building sites are reasonably safe from flooding
- **Carefully** consider requests for variance
- **Advise** FEMA when updates to flood maps are needed

Understanding the Riverine Floodplain

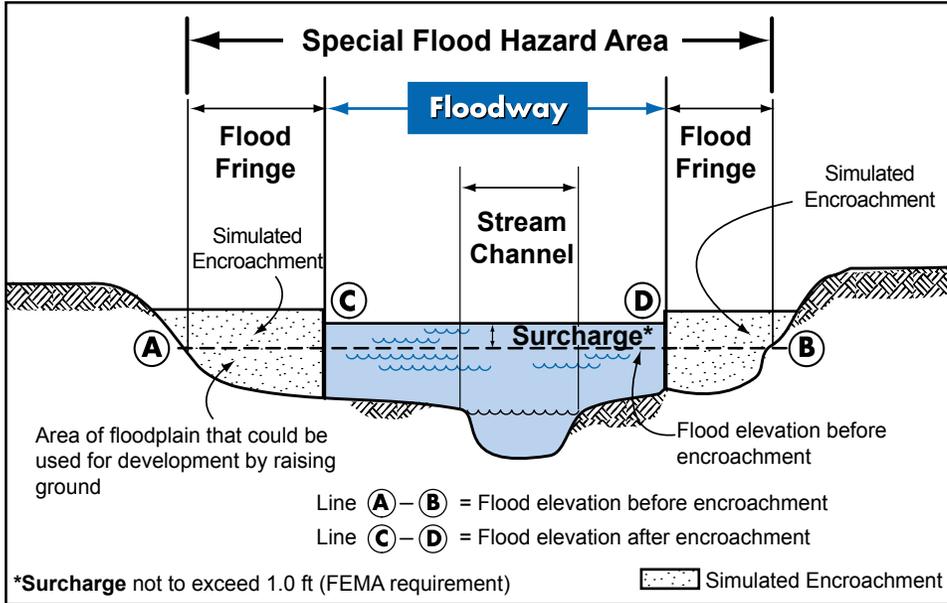


Terms and Definitions

Riverine floodplains are comprised of the floodway and the flood fringe. The floodway encompasses the channel and adjacent overbank areas necessary to convey floodwaters. The flood fringe is land outside the floodway that is at or below the BFE that stores, but does not effectively convey, floodwaters. Lands that compose the flood fringe will be inundated during a 1% chance flood event but, due to physical characteristics of the floodplain, do not effectively convey floodwaters. The floodway and the Base Flood Elevation (BFE) of the 1% annual chance flood are determined using hydraulic modeling techniques.

For floodplains with Base Flood Elevations (BFE), check the Flood Insurance Study (FIS) to find the Flood Profile which shows water surface elevations for the different frequency floods (see page 13).

Understanding the Floodway



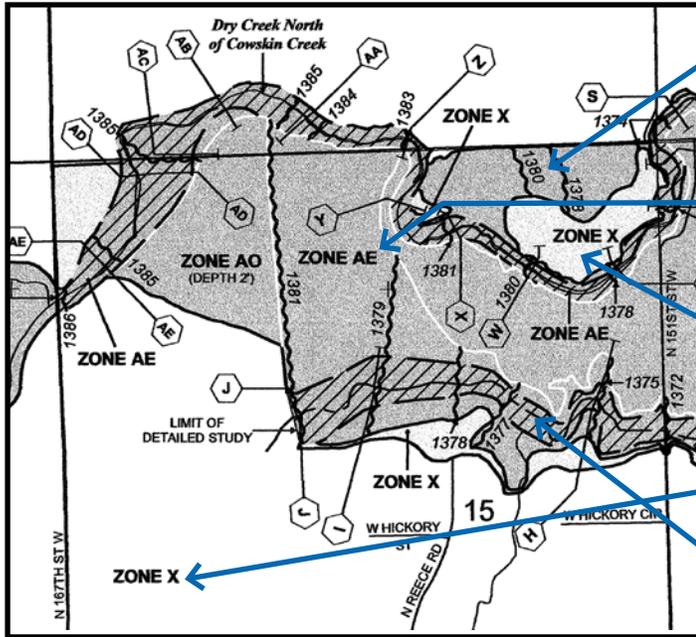
Terms and Definitions

The Floodway is the channel of a river or other water course and the adjacent land areas that must be reserved in order to pass the base flood discharge without increasing flood depths.

Computer models of the floodplain are used to simulate “encroachment” or fill in the flood fringe in order to predict where and how much the Base Flood Elevation (BFE) would increase if the floodplain is allowed to be filled.

Before a local permit can be issued for proposed development in the floodway, a “No Rise” certification must be submitted (see page 24). A qualified engineer must evaluate any proposed project to ensure it won’t increase flooding.

The Flood Insurance Rate Map



BASE FLOOD ELEVATION (BFE)

Water surface elevation of the base flood at specific locations

FLOOD HAZARD ZONES

Zone AO and **Zone AE** are subject to flooding by the base or 100-year flood (1% annual chance), and are considered to be high-risk areas.

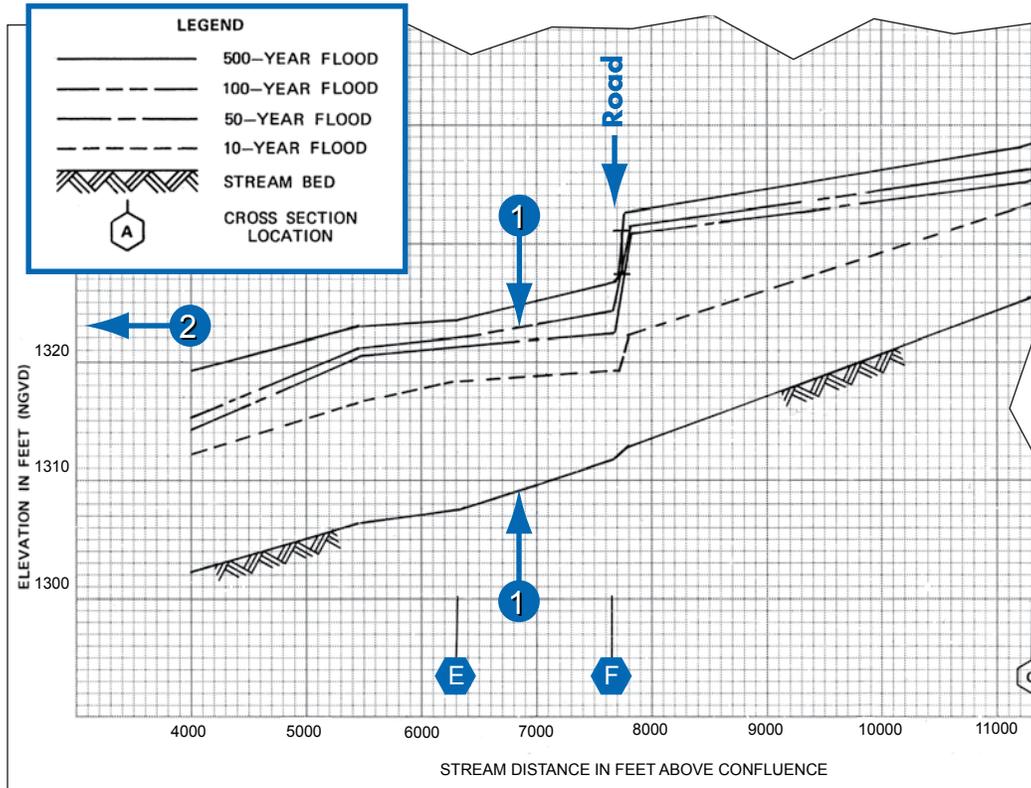
Zone X Shaded is subject to flooding by the 500-year flood (0.2% annual chance), and is a moderate risk area.

Zone X is all other areas, considered to be low risk.

The **Floodway** is the “cross-hatched” area

FEMA prepares Flood Insurance Rate Maps (FIRMs) to show areas that are at a high risk of flooding after intense or major storms. Many FIRMs show the flood elevation (how high the water may rise), called the Base Flood Elevation.

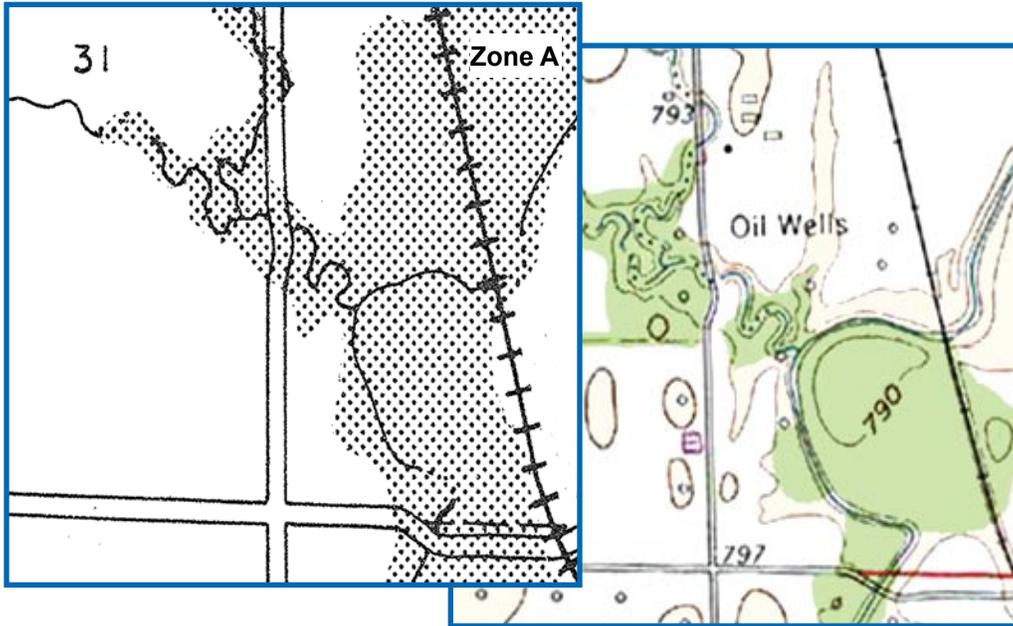
Use the Riverine Flood Profile to Determine BFEs



Flood profiles can be used to determine the BFE at a specific site. Profiles also show water surface elevations for floods other than the 100-Year Flood.

- 1 On the Flood Insurance Rate Map, locate your site by measuring the distance along the center line of the stream channel from a cross section, for example **E** or **F**.
- 2 Scale that distance on the Flood Profile and read up to the profile of interest, then across to determine the elevation. (Answer: 1,323 feet)

Approximate Flood Zone or Unnumbered Zone A



Approximate flood zones are drawn based on existing information, not engineering studies. FEMA checked with the U.S. Army Corps of Engineers, the U.S. Geological Survey, the State, local offices, and historic records. When existing information was lacking, FEMA performed an approximate analysis.

Topographic maps can be used to estimate the BFE.

If you need help in determining the BFE, check with KDA / DWR. FEMA publication “Managing Floodplain Development in Approximate Zone- A Areas” (FEMA 265) is also useful. It may be viewed or downloaded at: http://www.fema.gov/plan/prevent/fhm/dl_zonea.shtm

Letter of Map Change (LOMC)

There Are Three Primary Types of Letters of Map Change (LOMC) Issued by FEMA

- 1. Letter of Map Amendment (LOMA)** is an official amendment to an effective FIRM that may be issued when a property owner provides additional technical information, such as ground elevation relative to the SFHA and the building. Lenders may waive the flood insurance requirement if the LOMA documents a structure is on ground above the mapped floodplain.
- 2. Letter of Map Revision (LOMR)** is an official revision to an effective FIRM that may be issued to change flood insurance risk zones, floodplain and boundary delineations, BFEs and/or other map features. Lenders may waive the flood insurance requirement if the approved map revision shows structures to be outside the SFHA.
- 3. Letter of Map Revision Based on Fill (LOMR-F)** is an official revision to an effective FIRM that is issued to document FEMA's determination that a structure or parcel of land has been elevated by fill above BFE, and therefore is no longer in the SFHA. Lenders may waive the flood insurance requirement if the LOMR-F shows a structure on fill is above the BFE.



Important

Information

Check FEMA's Flood Hazard Mapping website for more information about map revisions concerning homeowners, engineers, and surveyors.

To learn the Status of Map Change Requests call FEMA's Map Service Center at 1-800-358-9616.

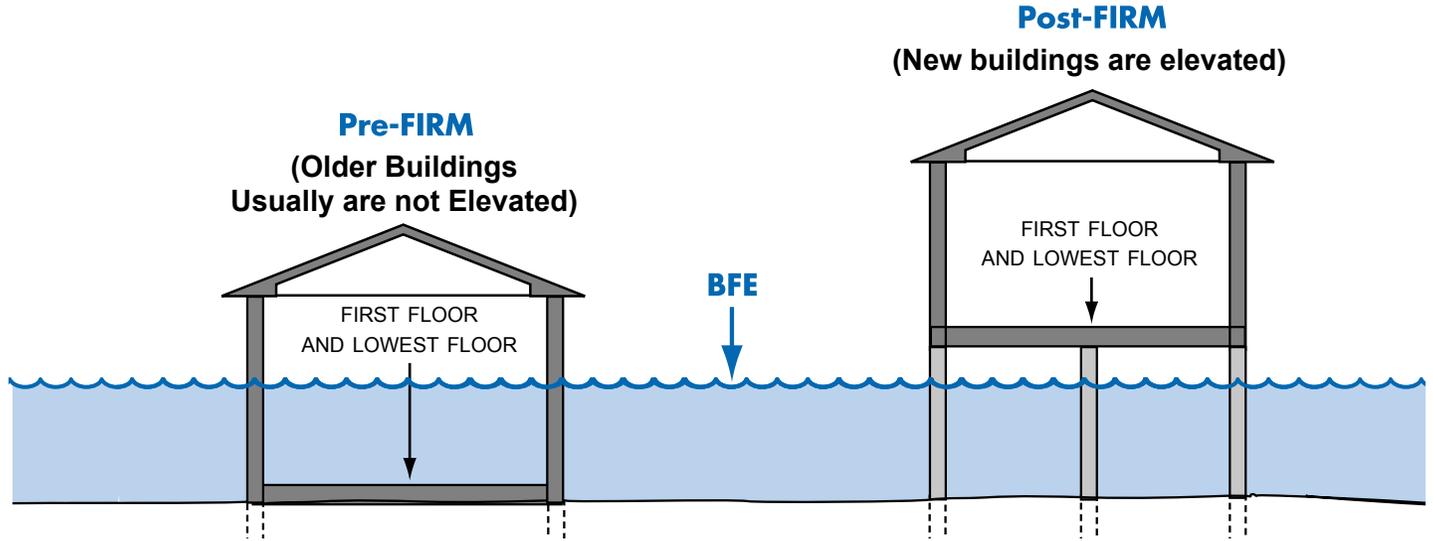
Information

<http://www.fema.gov/hazard/map/locm>

Forms

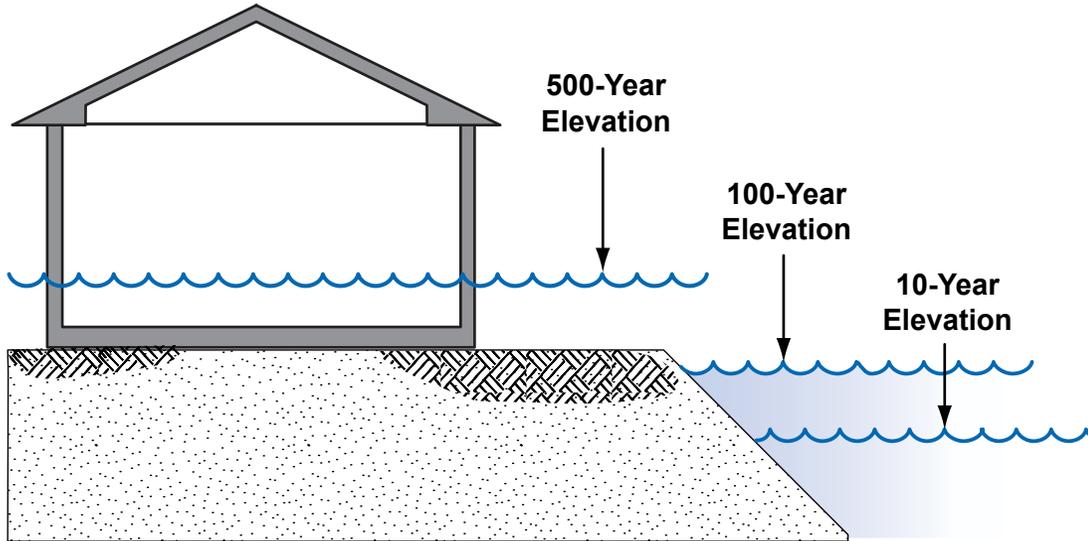
<http://www.fema.gov/business/nfip/forms>

What do Pre-FIRM and Post-FIRM Mean?



A building is Pre-FIRM if it was built on or before December 31, 1974 or before the effective date of your community's first Flood Insurance Rate Map (FIRM). If it was built after December 31, 1974 or the effective date of the first FIRM (whichever is later), it is Post-FIRM. Improvements or repairs to a Pre-FIRM building require permits (see pages 40 and 41).

Nature Doesn't Read Maps!



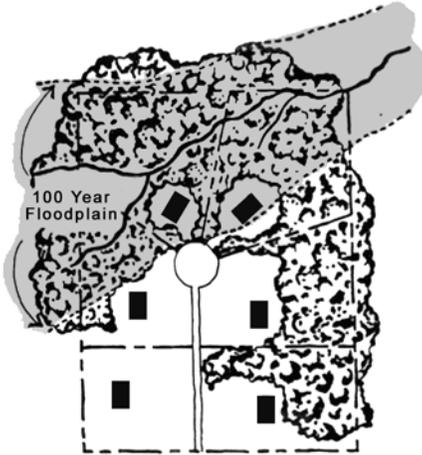
Important

Information

Many people don't understand just how risky the floodplain can be. There is a 26% chance that a home in the SFHA will flood during a 30 year mortgage period. The chance that a major fire will occur during the same period is only 9%!

CAUTION! Nature doesn't read maps! Major storms and flash floods can cause flooding that rises higher than the BFE. Consider Safety - protect homes and businesses by building higher. See page 48 to see how this will save money on flood insurance.

Safe Uses of the Floodplain

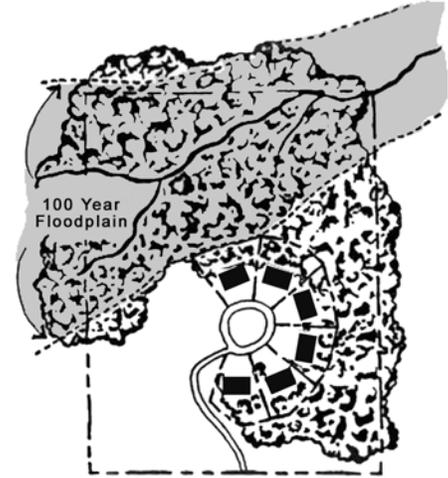
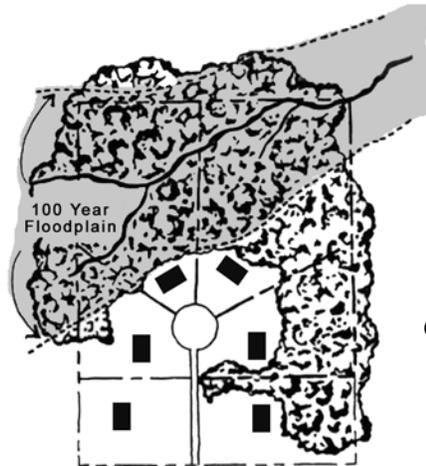


All land subdivided into lots, some homesites and lots partially or entirely in the floodplain.

NOT RECOMMENDED

All land subdivided into lots, some lots partially in the floodplain with setbacks to keep homesites on high ground.

RECOMMENDED



Floodplain land put into public/common open space, net density remains, lot sizes reduced and setbacks modified to keep homesites on high ground.

RECOMMENDED

Let the floodplain do its job - if possible, keep it natural open space. Other low damage uses include: parking, playgrounds, recreational areas, reforestation, gardens, pasture, accessory structures, and created wetlands.

Some Activities Requiring Floodplain Development Permits

- New construction
- Additions to existing structures
- Substantially improving existing structures
- Placing manufactured (mobile) homes
- Subdivision development
- Temporary buildings and accessory structures
- Agricultural buildings
- Parking or storage of recreational vehicles
- Storing materials, including fuel/chemical tanks
- Roads, bridges, and culverts
- Fill, grading, excavation, mining, and dredging
- Stream alteration



YOU NEED PERMITS FOR **ALL** OF THESE ACTIVITIES

Some Key Steps in Floodplain Development Permit Review

The Permit Reviewer has to check many things.
Some Key Questions are:

- Is the site in the mapped floodplain?
- Is the site in the mapped floodway?
- Have all state and Federal permits been obtained?
- Does the site plan show the Base Flood Elevation?
- Does the site plan show existing ground contours?
- Is substantial improvement of an older building being proposed?
- Is an addition proposed?
- Will new structures and utilities be properly elevated and anchored?
- Will the manufactured home be properly elevated and anchored?
- Do the plans show an appropriate and safe foundation?
- Has the owner submitted an Elevation Certificate?



Carefully Complete the Permit Application

KANSAS FLOODPLAIN DEVELOPMENT PERMIT/APPLICATION (excerpts)

Community Name: Anytown, KS Date: 9/27/07 Application #: 0001

SITE DATA

1. Location: Lot 4 block 6 of Div. A ¼ NE ¼ NE Section 1 Range 27s Township 28E
Street Address 1200 Jackson St.
2. Type of Development: Filling Grading _____ Excavation _____ Minimum Improvement _____
Routine Maintenance _____ Substantial Improvement _____ New Construction Other _____
3. Description of Development: Place fill to construct new home
4. Premises: Structure size 40 ft. x 30 ft. Area of site 10,000 sq. ft.
Principal use Residential Accessory uses (storage, parking, etc.) _____

PERMIT APPROVAL/DENIAL

Plans and Specifications Approved or Denied this 27 Day of September, 20 07
John Doe Mary Reviewer
Signature of Developer/Owner Signature of Authorizing Official

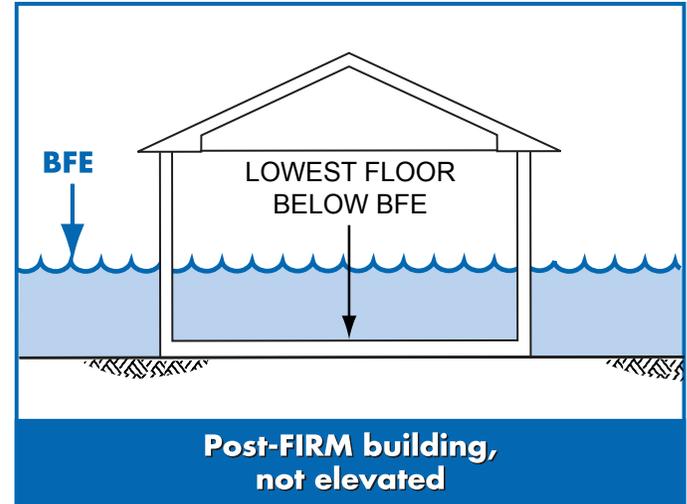
Good information will lead to better construction and less exposure to future flood damage.

Think Carefully Before Issuing a Variance

Very specific conditions must be satisfied to justify a variance:

- Good and sufficient cause
- Unique site conditions, lot size less than 1/2 acre
- Hardship related to property use (not the person)
- If in a floodway, no increase in flood level
- Shall not cause additional threats to public safety or extraordinary public expense

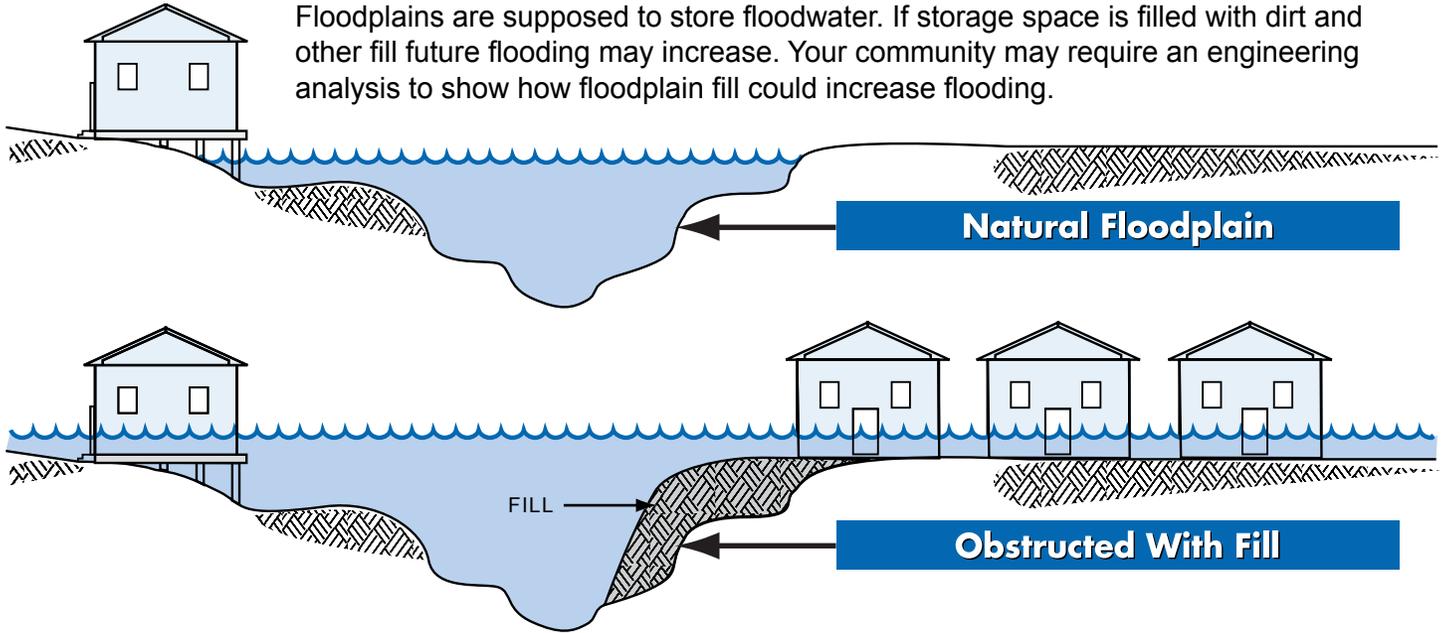
A community shall notify the applicant in writing over the signature of a community official that (i) the issuance of a variance to construct a structure below the BFE will result in increased premium rates for flood insurance up to amounts as high as \$25 for \$100 of insurance coverage and (ii) such construction below the BFE increases risk to life and property.



Think carefully about issuing a variance to build below the Base Flood Elevation. Not only will the property be more likely to get damaged, but insurance will be very costly (see page 48). If your community has a pattern of granting variances inconsistent with the local ordinance, sanctions can be imposed - costing even more!

Floodplain Fill Can Make Things Worse

Floodplains are supposed to store floodwater. If storage space is filled with dirt and other fill future flooding may increase. Your community may require an engineering analysis to show how floodplain fill could increase flooding.



Make sure your floodplain fill project won't harm your neighbors. Floodway fill is allowed **ONLY** if an engineering evaluation demonstrates that "no rise" in flood level will occur (see page 24).

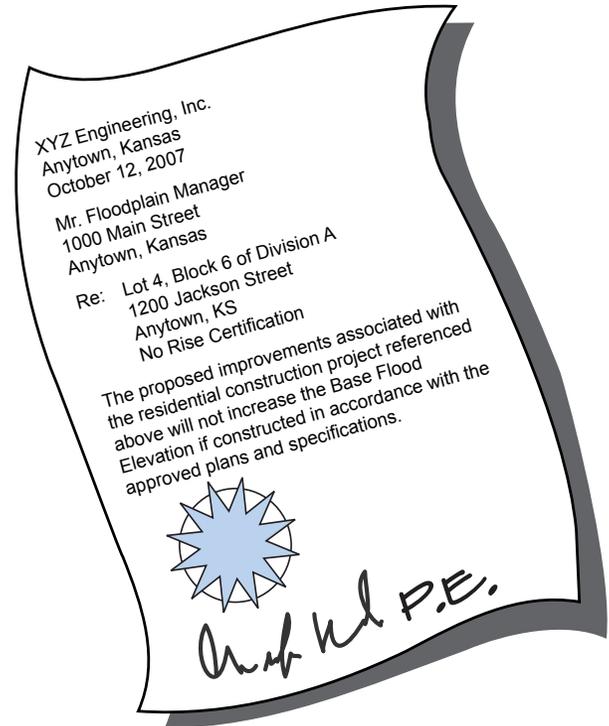
The Floodway “No-Rise ” Certification

Prior to a community issuing a floodplain development permit involving activities in a regulatory floodway, the community must obtain from the party requesting the permit, an engineering certification stating the proposed floodway development will not obstruct the floodway and will result in no increase in height of the base flood elevation. The “no-rise” certification should be signed and sealed by a professional engineer.

The engineering or “no-rise” certification must be supported by technical data or an explanation of why a hydraulic analysis is not required. A hydraulic analysis is required in most cases. The supporting technical data should be based upon the standard step-backwater computer model utilized to develop the 1-percent annual chance (100-year) floodway shown on the community’s effective Flood Insurance Rate Map (FIRM) or Flood Boundary and Floodway Map (FBFM) and the results tabulated in the community’s Flood Insurance Study (FIS).

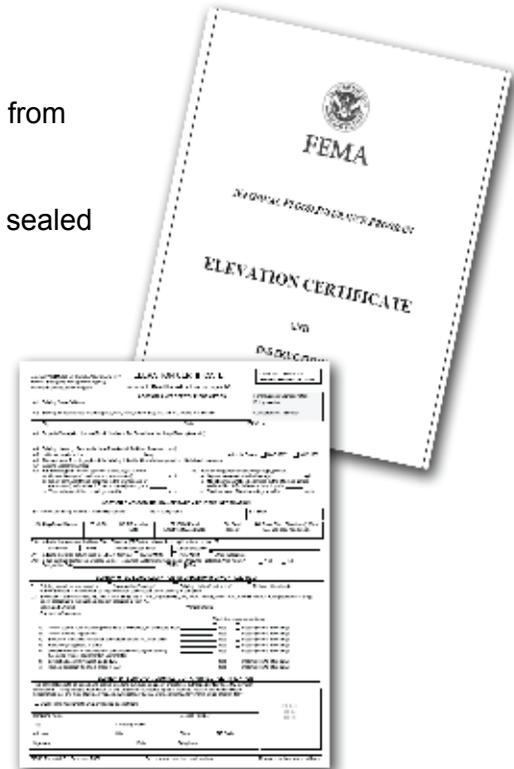
The community is required to review and approve the “no-rise” certification submittal and maintain a copy in the permit file.

Reduce flood risk - don’t build in the Floodway!



What is an Elevation Certificate and How is it Used?

- The Elevation Certificate (EC) is a FEMA form. Download a copy from <http://www.fema.gov/business/nfip/forms.shtm>.
- When the floodplain has BFEs, the EC should be completed and sealed by a registered surveyor or engineer.
- It can be used to show that sites are natural ground above Base Flood Elevation (see page 27).
- It is used to verify that buildings are elevated properly (see page 26).
- Insurance agents use the EC to write flood insurance policies.
- By itself, the EC cannot be used to waive the requirement to purchase flood insurance. (See page 15 to learn about Letters of Map Amendment (LOMA).)



Completing the Elevation Certificate

SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

- C1. Building elevations are based on: Construction Drawings* Building Under Construction* Finished Construction
 *A new Elevation Certificate will be required when construction of the building is complete.
- C2. Elevations – Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO. Complete Items C2.a-g below according to the building diagram specified in Item A7.
- Benchmark Utilized N/A Vertical Datum NAVD 88
- Conversion/Comments _____

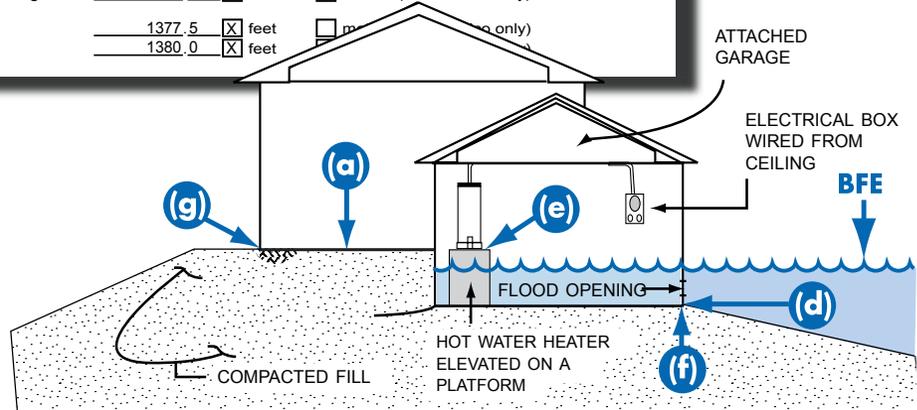
Check the measurement used.

- | | | | |
|---|---------------|--|--|
| a) Top of bottom floor (including basement, crawl space, or enclosure floor) | <u>1380.0</u> | <input checked="" type="checkbox"/> feet | <input type="checkbox"/> meters (Puerto Rico only) |
| b) Top of the next higher floor | <u>N/A</u> | <input type="checkbox"/> feet | <input type="checkbox"/> meters (Puerto Rico only) |
| c) Bottom of the lowest horizontal structural member (V Zones only) | <u>N/A</u> | <input type="checkbox"/> feet | <input type="checkbox"/> meters (Puerto Rico only) |
| d) Attached garage (top of slab) | <u>1377.5</u> | <input checked="" type="checkbox"/> feet | <input type="checkbox"/> meters (Puerto Rico only) |
| e) Lowest elevation of machinery or equipment servicing the building (Describe type of equipment in Comments) | <u>1380.0</u> | <input checked="" type="checkbox"/> feet | <input type="checkbox"/> meters (Puerto Rico only) |
| f) Lowest adjacent (finished) grade (LAG) | <u>1377.5</u> | <input checked="" type="checkbox"/> feet | <input type="checkbox"/> meters (Puerto Rico only) |
| g) Highest adjacent (finished) grade (HAG) | <u>1380.0</u> | <input checked="" type="checkbox"/> feet | <input type="checkbox"/> meters (Puerto Rico only) |

Elevation Certificate (Partial)

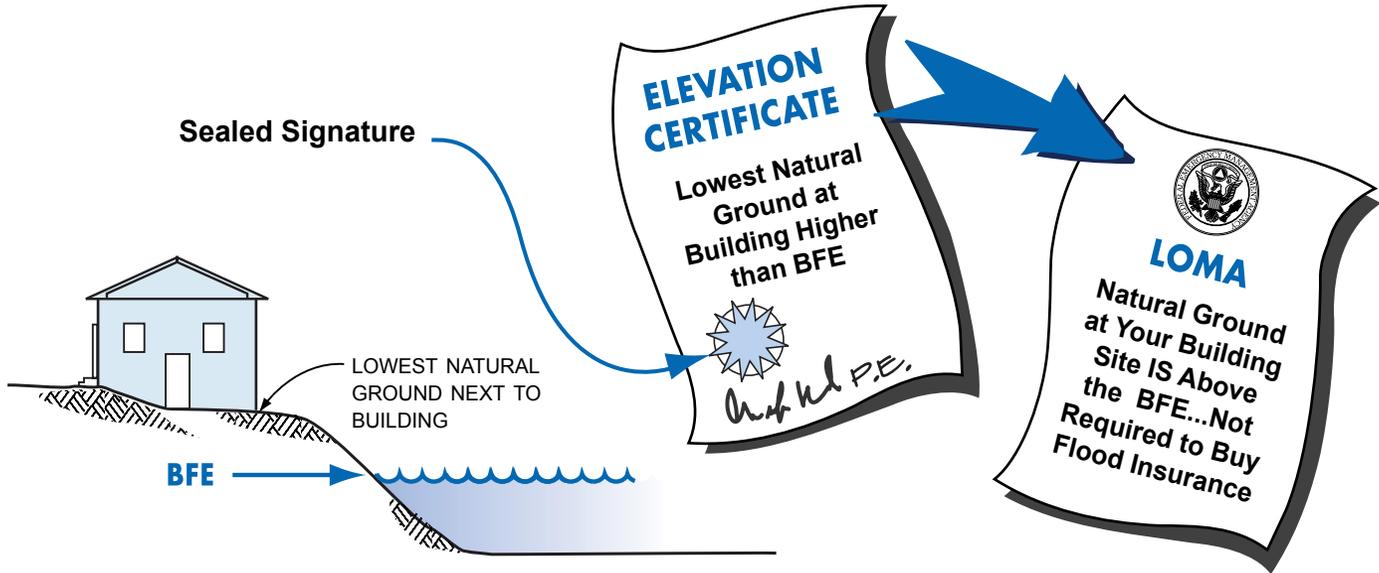
In this example, the BFE is 1379.

The slab-on-grade house was elevated on fill 1' above the BFE, and the vented garage is 2.5' below BFE.



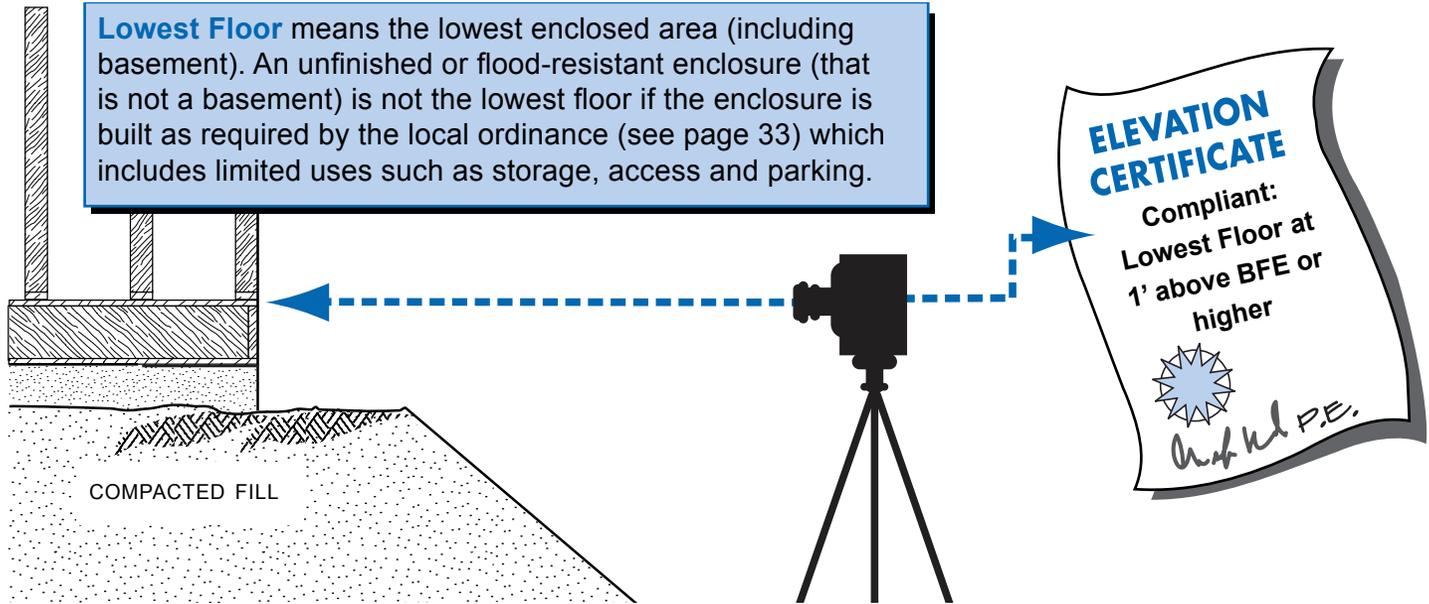
You will get a blank Elevation Certificate form when you get your permit. You must have a surveyor or engineer fill it out and seal it. The Elevation Certificate includes diagrams for eight building types. Several points must be surveyed.

Is Your Building Site Higher than the BFE?



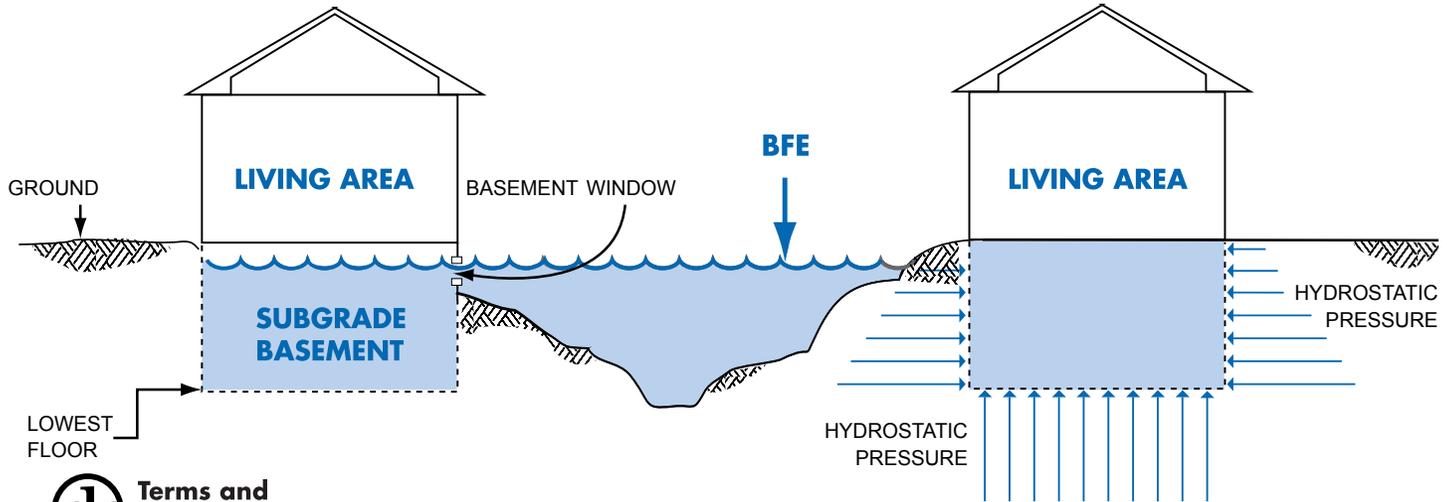
If your land is shown on the maps as “in” the floodplain, but your building site is higher than the BFE, get a surveyor or engineer to complete a FEMA Elevation Certificate (EC). Submit the EC with an application for a LOMA to FEMA and a LOMA may be issued (see page 15). This is the only way to remove the requirements to purchase flood insurance. Keep the certificate with your deed - it will help future buyers.

Paperwork is Important for You and Your Community



If you get a permit to build in the floodplain, you will be given an Elevation Certificate form. As soon as your Lowest Floor is set, get the form filled out and sealed by a surveyor or engineer. This form is **IMPORTANT!** It proves that you built correctly, and it can be used to get the lowest cost flood insurance (see page 48).

Basements in Special Flood Hazard Areas



Terms and Definitions

A **basement** is any portion of a structure that has a subgrade floor (below ground level) on all sides.

Basements below BFE are not allowed in new development. For a good reason, flood insurance coverage is very limited in existing basements. As little as an inch of water pouring continuously through a basement window can fill the basement!

Elevate on Foundation Walls

SERVICE EQUIPMENT SUCH AS UTILITIES AND ELECTRICAL CIRCUITS ABOVE FLOOD LEVEL

OPENINGS ON AT LEAST TWO WALLS ALLOW WATER TO FLOW IN AND DRAIN OUT

ENCLOSED AREA ONLY FOR PARKING, ACCESS OR LIMITED STORAGE

LOWEST FLOOR

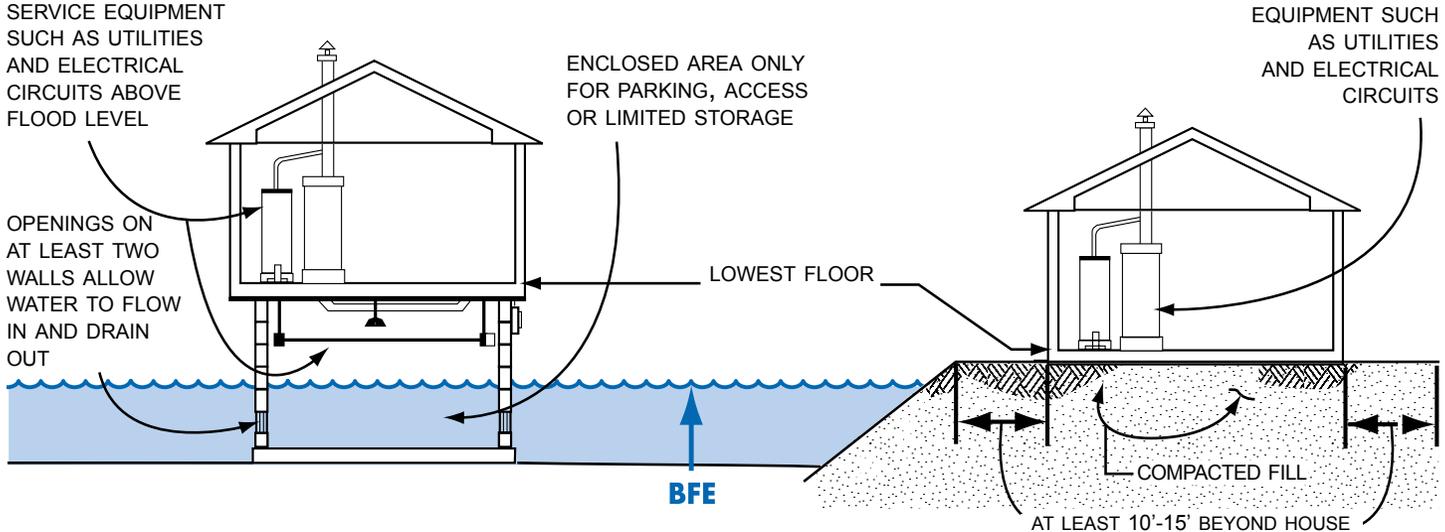
BFE

Elevate on Fill

SERVICE EQUIPMENT SUCH AS UTILITIES AND ELECTRICAL CIRCUITS

COMPACTED FILL

AT LEAST 10'-15' BEYOND HOUSE

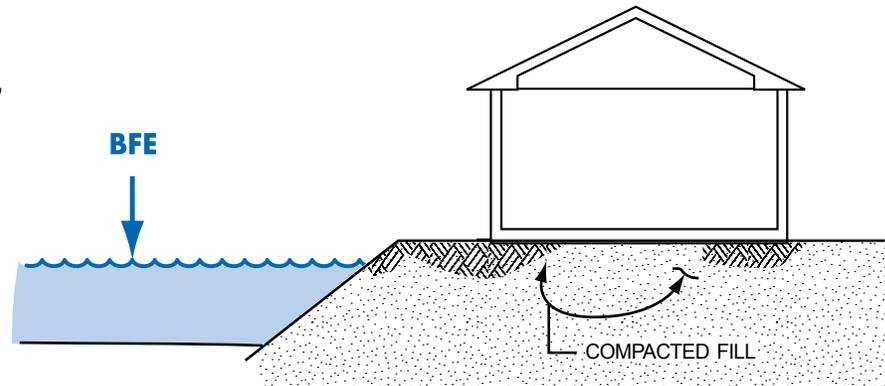


CAUTION! Enclosures (including crawlspaces) have special requirements (see page 33). NOTE: When the walking surface of the lowest floor is at the minimum elevation, under floor utilities are not allowed.

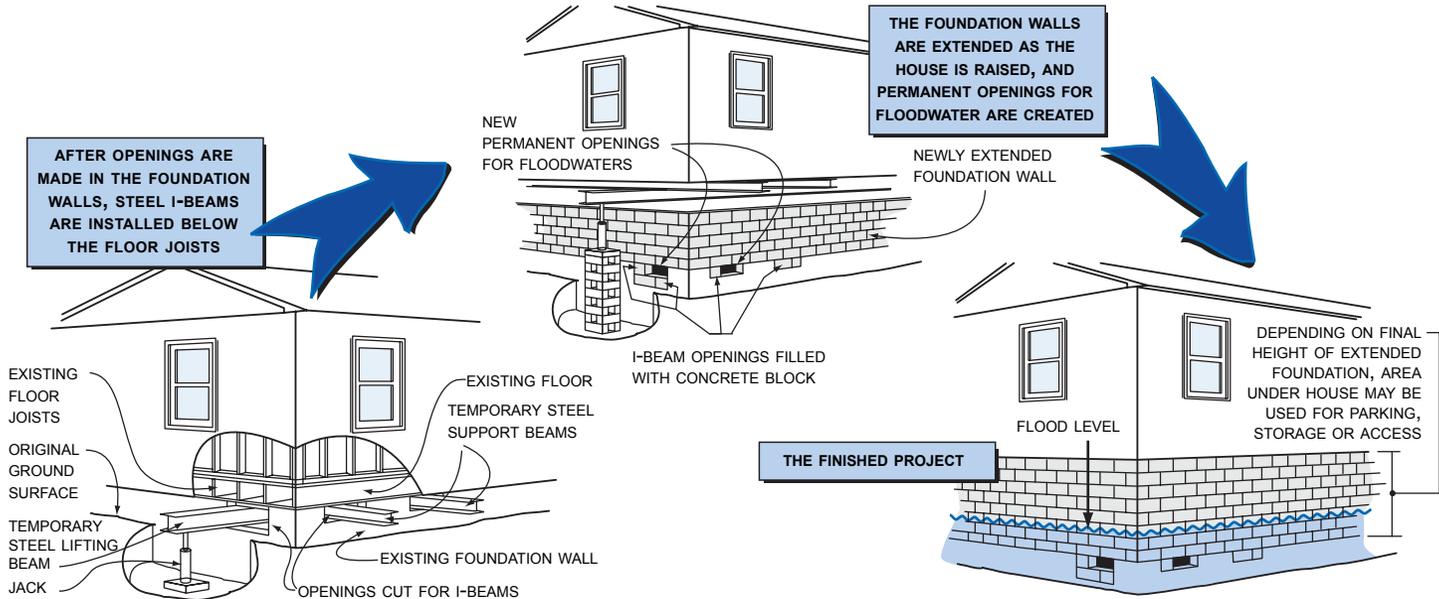
Compaction of Floodplain Fill

Earthen fill used to raise the ground above the flood elevation must be placed properly so that it does not erode or slump when water rises. For safety and to meet floodplain requirements, floodplain fill should:

- Have grade side slopes determined by engineering analysis
- Have slopes protected against erosion (vegetation for “low” velocities, durable materials for “high” velocities – determined by a design professional)
- Be machine compacted to 95 percent of the maximum density (determined by a design professional)
- Be good clean soil, free of large rocks, construction debris, and woody material (stumps, roots)



Elevating A Pre-FIRM Structure



This is one way to elevate an existing building to comply with floodplain regulations. The state and FEMA can help with more information and options.

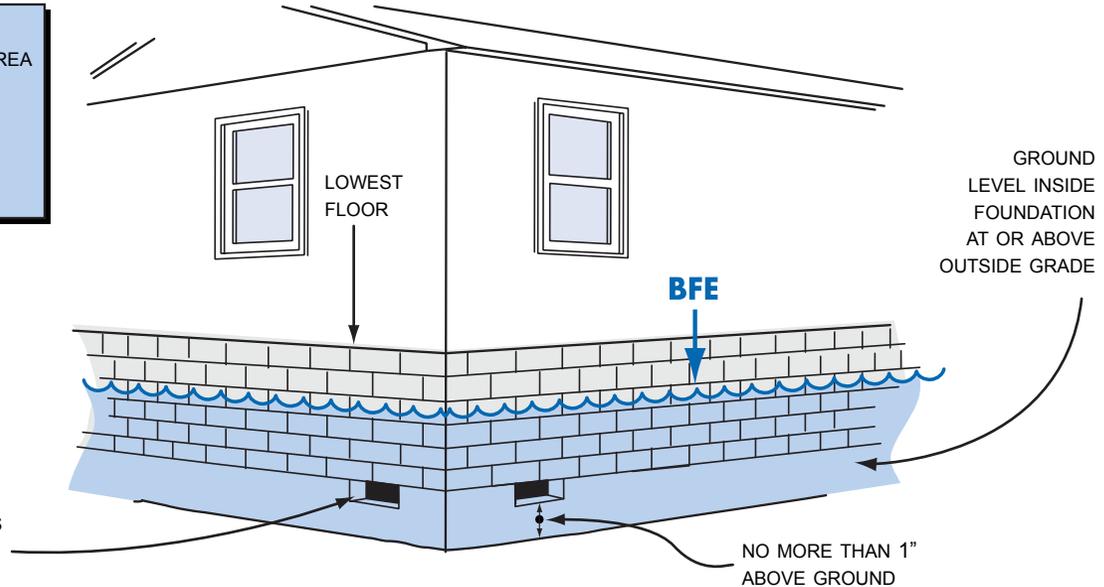
Enclosures Below BFE

NOTE:

- TOTAL MINIMUM OPENING AREA IS 1 SQ. IN. PER SQ. FT. OF ENCLOSED SPACE
- A 1200 SQ. FT. BUILDING NEEDS 1200 SQ. IN. OF OPENINGS

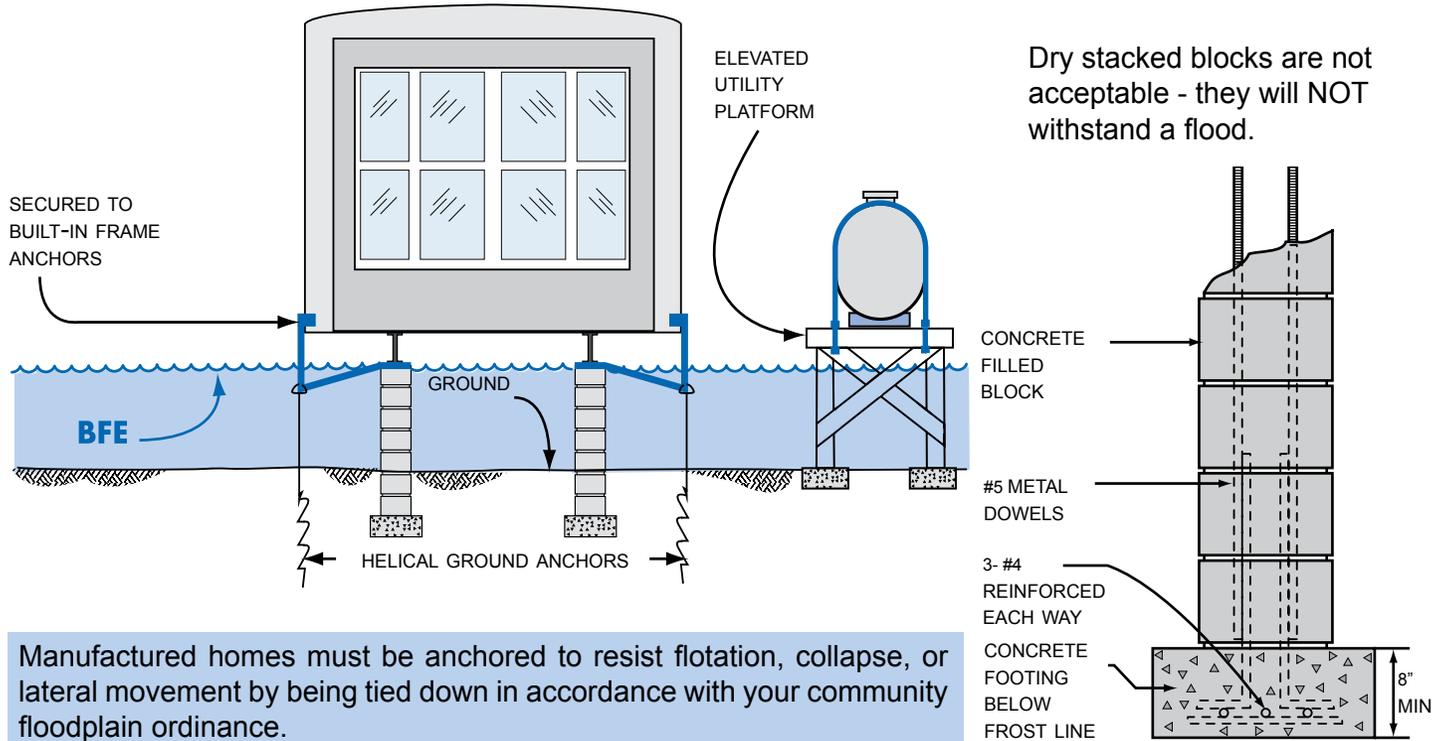
CRAWLSPACE BUILDING

AT LEAST TWO FLOOD OPENINGS ON DIFFERENT SIDES



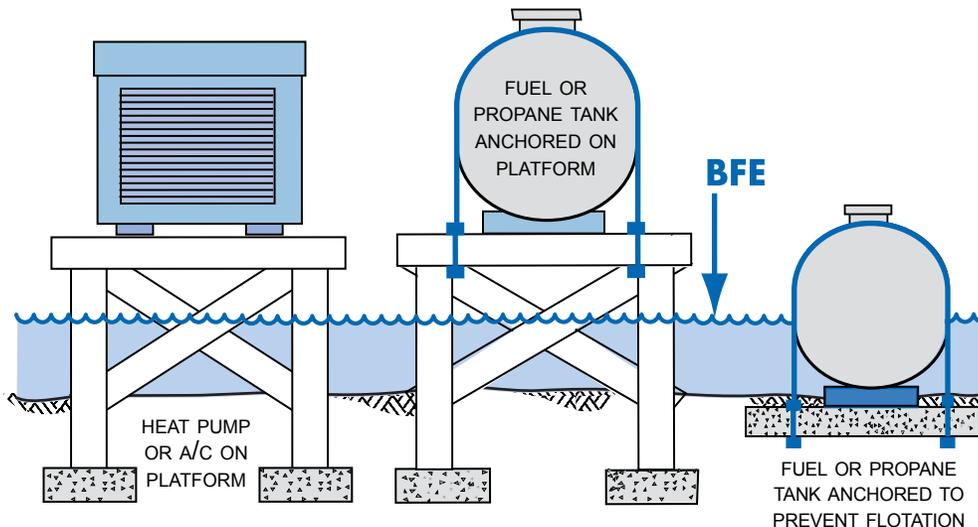
Solid perimeter wall foundations can enclose flood-prone space. A crawlspace is a good way to elevate just a couple of feet. In all cases the following are required: openings/vents, elevated utilities, flood resistant material, and limitation on use. **IMPORTANT:** All under floor utilities, including duct work, must be above the BFE.

Manufactured Homes Deserve Special Attention



Utility Service / Fuel Tanks

All utilities, appliances and equipment must be elevated one foot above the BFE or protected against flood damage. Utilities include plumbing, electrical, gas lines, fuel tanks and heating and air conditioning equipment.



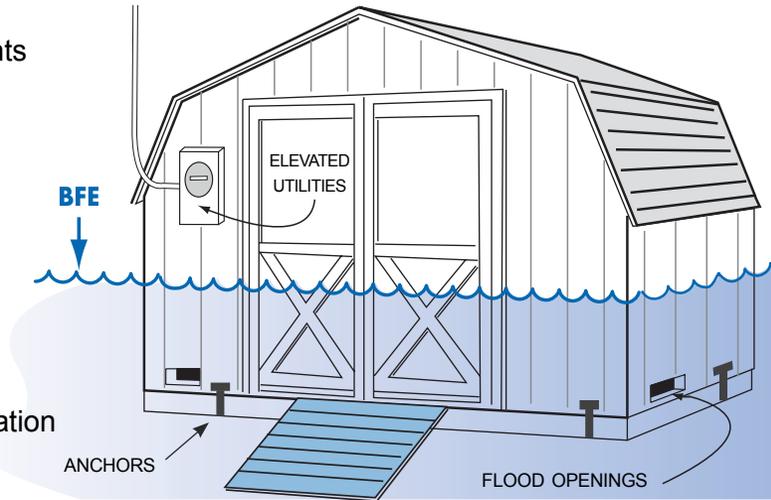
Important Information

In the Special Flood Hazard Area (SFHA) an above ground liquid propane gas (LPG) or home heating oil fuel tank should be elevated one-foot above the BFE or the fuel tank should be designed, constructed, installed and ground anchored to resist all flood-related and other loads including the force of buoyancy during the Base Flood without release of contents into floodwaters or infiltration by floodwaters into the contents.

Fuel and propane tanks can pose serious threats to people, property and the environment during flood conditions. Even shallow water can create a large buoyant force on tanks. Videos on “Fuel Tank Flood Hazards” and “How to Anchor Home Fuel Tanks” are available from FEMA Publications at 1-800-480-2520 and “How-To Guides” on anchoring fuel tanks are available at: <http://www.fema.gov/plan/prevent/howto/how2005.shtm>.

Accessory (Appurtenant) Structures

- Cannot be modified for a different use in the future
- Used only for parking or storage
- Flood openings / vents
- Elevated Utilities
- Anchored to resist flotation
- Not habitable
- Document floor elevation



Terms and Definitions

Accessory (Appurtenant) Structure means a structure that is located on the same parcel of land as a principle structure and whose use is incidental to the use of the principle structure. Accessory structures should be no more than a minimal initial investment, may not be used for human habitation, and must be designed to minimize flood damage. Examples: detached garages, carports, storage sheds, pole barns, and hay sheds.

Even small buildings are considered “development” and permits or variances with noted conditions are required. They must be elevated, anchored, and built to withstand flood damage.

CAUTION! Remember...Everything inside is likely to get wet when flooding occurs.

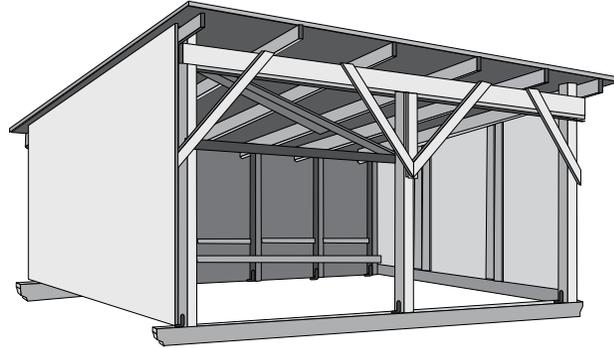
Agricultural Structures

Variances are allowed for:

- Pole frame buildings
- Steel grain bins
- Steel frame corn cribs
- General purpose feeding barns open on one side

Variances are not allowed for:

- Livestock confinement buildings
- Poultry houses
- Dairy Operations
- Other similar livestock operations



Important

Information

Farm houses are **NOT** agricultural structures

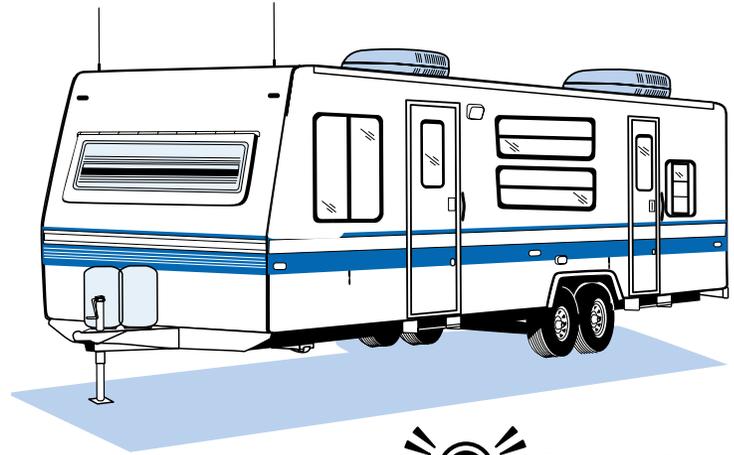
The best flood protection is to elevate agricultural structures, but certain types can be approved by variance if they are “wet floodproofed.”

Recreational Vehicles

The state requires that recreational vehicles placed on sites within all unnumbered and numbered A zones, AE, AH, and AO zones on the community's FIRM either:

- Remain on site for fewer than 180 consecutive days, or
- Be fully licensed and ready for highway use; or
- Meet the permitting, elevation, and anchoring requirements for manufactured homes of the community's Floodplain Management Ordinance.

A recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick-disconnect type utilities and security devices, and has no permanently attached additions.



Important

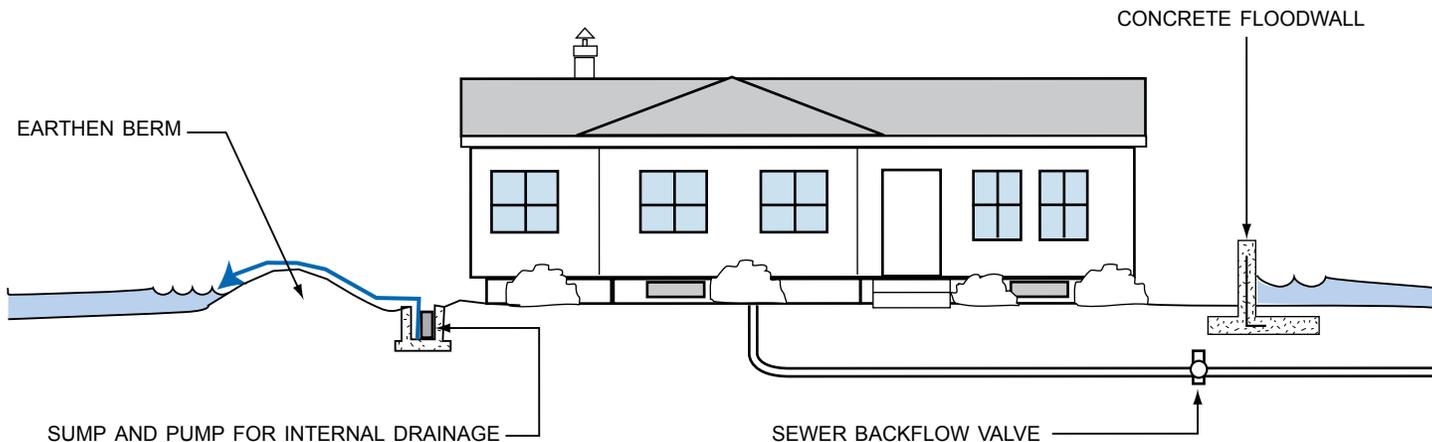
Information

Camping near the water?
Ask the Campground or RV
Park operator about flood
warnings and plans for safe
evacuations.

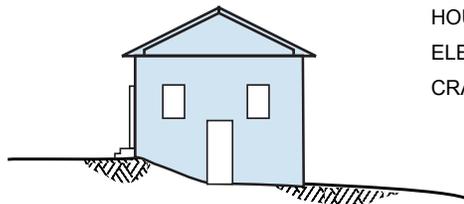
RVs that do not meet these conditions must be installed and elevated like a manufactured home, including a permanent foundation and tie-down (see page 34)

Small Berms and Floodwalls Can Protect Pre-FIRM Structures

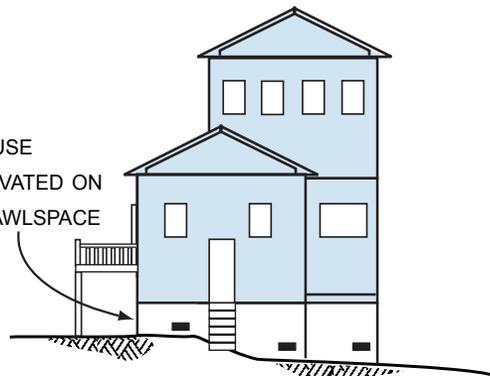
In areas where flood waters are not expected to be deep, sometimes individual buildings can be protected by earthen berms or concrete floodwalls. Permits are required for those protection measures, and extra care must be taken if the site is in a floodway (see pages 23 and 24). A berm or floodwall does not remove building elevation requirements and cannot be used to protect a new or substantially improved structure, or one that is repaired after substantial damage. **IMPORTANT!** These protective measures **WILL NOT** reduce flood insurance premiums!



Before Improvements
Building Market Value = \$100,000
(excluding land value)



HOUSE
ELEVATED ON
CRAWLSPACE



After Improvements
Cost of Improvements = \$68,000
Building Market Value = \$168,000

Terms and Definitions

Substantial Improvement means any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50% of the market value of the structure before the start of construction of the improvement.

This term includes structures which have incurred **Substantial Damage**, regardless of the actual repair work performed (see page 41).



Important

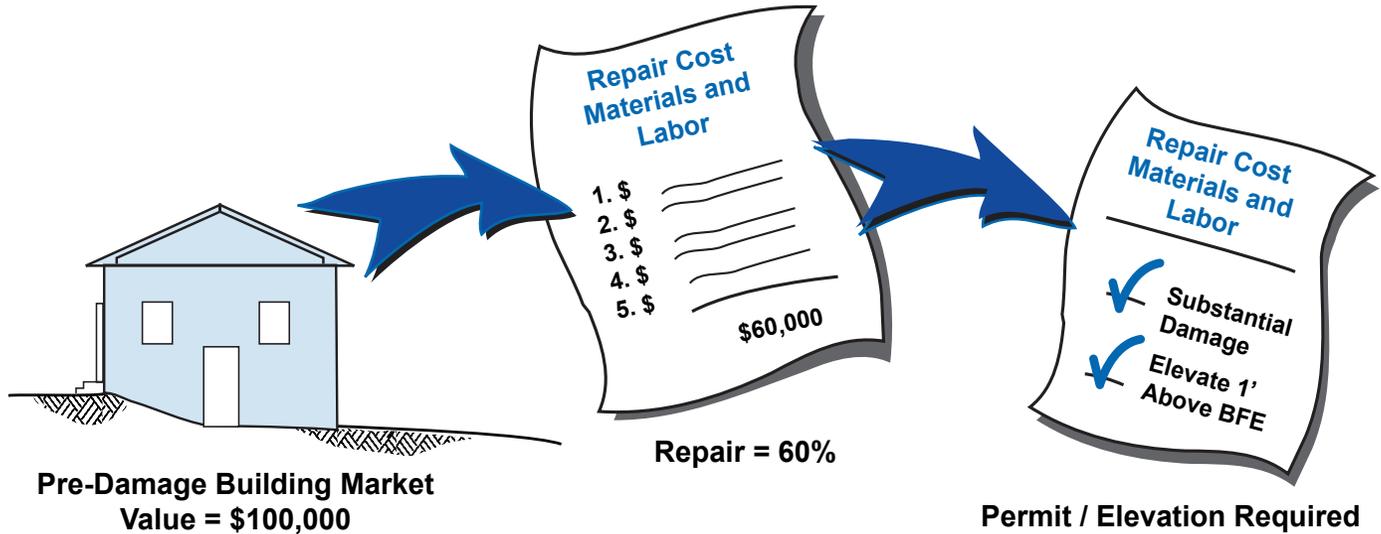
Information

See Unit 8 of the FEMA National Flood Insurance Program Floodplain Management Requirements Study Guide and Desk Reference for Local Officials for a detailed description of substantial improvement and its application to structure rehabilitations and additions.

The cost to correct violations of state or local health, sanitary, or safety regulations to provide safe living conditions can be excluded.

Alteration of a registered historic structure is allowed, as long as it will continue to meet the criteria for listing as a registered historic structure.

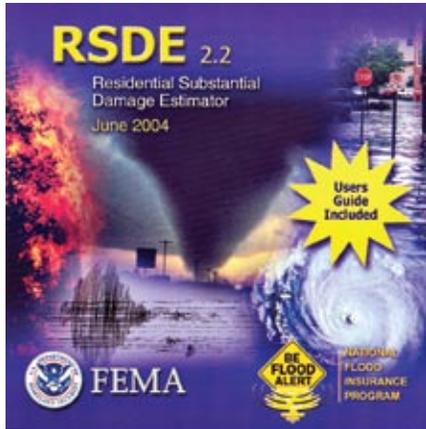
What About After Damage?



A Floodplain Development Permit is required to repair substantial damage from any cause - fire, flood, wind, or even a truck running into a building. Check with the floodplain administrator in your community. You will be asked to provide a detailed cost estimate for repairs. See page 5 for definitions of substantial damage and substantial improvement.

Residential Substantial Damage Estimator

Communities participating in the National Flood Insurance Program (NFIP) often have difficulty determining whether buildings are substantially damaged. This difficulty is magnified after a major flood or other disaster where a large number of buildings have been damaged and there is a need to provide timely substantial damage determinations so that reconstruction can begin. Buildings located in a Special Flood Hazard Area (SFHA) that are determined to be substantially damaged/improved, must be brought into compliance with the minimum requirements of the community's NFIP compliant floodplain management laws or ordinances. The regulations may require a residential building to be elevated, resulting in additional repair/reconstruction costs for the homeowner.



FEMA has developed a computer program, called the Residential Substantial Damage Estimator (RSDE), to assist state and local officials in estimating building value and damage costs for both single family and manufactured homes. This computer application is based on regulatory requirements of the NFIP and is intended to be used in conjunction with an industry accepted residential cost estimating guide.

The program consists of step-by-step directions, with accompanying illustrations showing where data regarding the pre-disaster fair market value of a structure, the cost of repair and percentage of damage to components of a structure can be entered. Based on the data inputted the program computes the overall damage percentage.

Call FEMA Publications at 1-800-480-2520 to order your free copy of the RSDE software.

Paying for Post-Flood Compliance - ICC



Increased Cost of Compliance, or ICC, coverage is part of most Standard Flood Insurance Policies. Claims for ICC benefits are filed separately from your claim for contents or building loss. If eligible, you can collect up to \$30,000 to help cover the cost of bringing your home or business into compliance with floodplain ordinances.

You are eligible to file for ICC if your property is in a SFHA and if your community floodplain administrator determines one of the following:



Your property is “substantially damaged.” This means that your community says the cost to repair your flooded building is 50% or more of its pre-disaster market value.

Your property sustained “repetitive damage.” This term applies to homes or businesses that were damaged by flooding twice in the past 10 years, where the cost of repairing the flood damage, on average, equaled or exceeded 25% of the property market value at the time of each flood. Also, there must have been flood insurance claim payments for each of the two flood losses, and the community’s floodplain management ordinance must have a repetitive loss provision.



ICC funding can be used to elevate or demolish homes, relocate them to higher ground, or floodproofing of non-residential properties. Also, when participating in a community sponsored, FEMA funded mitigation project, the policyholder may assign ICC benefits to the community to integrate into the project. The community then becomes responsible for submitting all of the appropriate paperwork.

Detailed information on ICC is available at <http://www.fema.gov/plan/prevent/floodplain/ICC.shtm>

Repetitive Loss Eligibility under ICC

Your Community's Floodplain Management (FPM) Ordinance must be amended to make Repetitive Loss (Rep Loss) insured structures eligible to receive ICC benefits up to \$30,000. If a community has a "Repetitive Loss" definition in the FPM ordinance, ICC benefits will be paid when a flood insured structure in the SFHA is paid flood damage claims two times within a 10-year period, where the cost of repairing the flood damage, on the average, equals or exceeds 25 percent of the structure's pre-damaged fair market value at the time of each flood. Rep Loss is not eligible under ICC unless Rep Loss is defined in the definitions section of the community's FPM ordinance.

To make Rep Loss structures eligible for ICC benefits:

1. Add a new definition to the FPM ordinance as underlined below:

Repetitive Loss means flood-related damages sustained by a structure on two separate occasions during a 10-year period for which the cost of repairs at the time of each such flood event, equals or exceeds twenty-five percent of the market value of the structure before the damage occurred.

2. Modify this definition in the FPM ordinance by adding the following underlined text:

Substantial Damage means damage of any origin sustained by a structure whereby the cost of restoring the structure to its before-damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred. The term includes buildings that are determined to be Repetitive Loss (see definition).

For the purposes of this definition, "repair" is considered to occur when the first repair or reconstruction of any wall, ceiling, floor, or other structural part of the building commences.

The term does not apply to:

- a.) any project for improvement of a building required to comply with existing health, sanitary, or safety code specifications which have been identified by the Code Enforcement Official and which are solely necessary to assure safe living conditions, *or*

Repetitive Loss Eligibility under ICC (continued)

- b.) any alteration of a “historic structure” provided that the alteration will not preclude the structure’s continued designation as a “historic structure”, *or*
- c.) any improvement to a building.

3. Modify this definition in the FPM ordinance by adding the underlined text:

Substantial Improvement means any combination of reconstruction, alteration, or improvement to a building, taking place in a 10-year period, in which the cumulative percentage of improvement equals or exceeds fifty percent of the fair market value of the building before the damage occurred. For the purposes of this definition, an improvement occurs when the first alteration of any wall, ceiling, floor, or other structural part of the building commences, whether or not that alteration affects the external dimensions of the building. This term includes structures, which have incurred “repetitive loss” or “substantial damage”, regardless of the actual repair work done.

The term does not apply to:

- a.) any project for improvement of a building required to comply with existing health, sanitary, or safety code specifications which have been identified by the Code Enforcement Official and which are solely necessary to assure safe living conditions, *or*
- b.) any alteration of a “historic structure” provided that the alteration will not preclude the structure’s continued designation as a “historic structure,” *or*
- c.) any building that has been damaged from any source or is categorized as repetitive loss.

Substantially improved existing manufactured home parks or subdivisions is where the repair, reconstruction, rehabilitation or improvement of the streets, utilities and pads equals or exceeds 50 percent of the value of the streets, utilities and pads before the repair, reconstruction or improvement commenced.

SPECIAL NOTE: It is recommended that communities develop and adopt written substantial improvement policies and procedures.

Flood-prone Property Acquisition Projects

Authorized under Section 404 of the Stafford Act, the Hazard Mitigation Grant Program (HMGP), administered by the Federal Emergency Management Agency (FEMA), provides grants to states, and states to eligible applicants, to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the program is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster.

Participation in HMGP acquisition projects is totally voluntary: jurisdictions are not required to apply for funds and homeowners are not required to sell. Funding is 75% federal share, 25% non-federal share. The program is administered by the Kansas Division of Emergency Management (KDEM). Eligible HMGP project applicants include state agencies, county and city governments, certain private non-profit organizations and Indian tribes or authorized tribal organizations. Individuals must work through their local government.

Acquisition and demolition of substantially damaged buildings located in the SFHA is the first priority for HMGP project funding in Kansas because it is a permanent mitigation solution to the potential future risk of damage from the 1% or greater annual chance flood. HMGP is the primary funding source to purchase substantially damaged property in the Special Flood Hazard Area (SFHA).

Communities offer to buy private property at pre-disaster fair market value and clear the land. Properties that have been damaged or even completely destroyed can still be purchased at pre-disaster fair market value. All structures purchased are demolished and the deed to HMGP acquired land must contain a restriction ensuring that the community owned land remains in perpetuity as open space.

Limited funding for acquisitions is also available in other FEMA Mitigation Grant programs. For more information go to: http://www.fema.gov/government/grant/fs_mit_grant_prog.shtm

Flood Insurance is Your Best Protection

Who needs flood insurance? **EVERYONE!** Every homeowner, business owner, and renter in one of Kansas' more than 340 communities participating in the National Flood Insurance Program may purchase a flood insurance policy - regardless of the location of the structure.

Unfortunately, it's usually after a flood that most people discover their homeowners insurance does not cover flood damages. Every building is located within a flood zone - some zones are high risk, some are low risk. Approximately 25% of all insured flood damages occur in low risk zones, commonly described as "outside the mapped floodplain".



The Kansas Department of Agriculture, Division of Water Resources and the Kansas Association for Floodplain Management urge you to protect your financial future by getting a flood insurance policy. To purchase a policy, call your insurance agent. To get the name of an agent in your community, call the NFIP's toll free number **1-888-FLOOD29**.

Freeboard: Go an Extra Foot - Save Money!

Want to save some money and have peace of mind at the same time? Then add Freeboard to build higher than the minimum elevation requirement! In Kansas new construction and substantially improved structures must be built one foot above BFE. Additional Freeboard will add safety and reduce flood insurance costs.

Annual Flood Insurance Premium* Example:
 Flood Zone A-AE, Post-FIRM, One-Story Residence, No Basement
 Lowest floor elevation compared to the Base Flood Elevation (BFE)

Lowest Floor Elevation	Structure \$150,000	Contents \$50,000	Federal Policy Fee	ICC Fee	Total Annual Premium	30-Yr. Mortgage Total Flood Insurance Cost
3' above	\$234	\$224	\$30	\$4	\$492	\$14,760
2' above	\$299	\$224	\$30	\$4	\$557	\$16,710
1' above	\$449	\$289	\$30	\$4	\$769	\$23,070
At BFE	\$789	\$644	\$30	\$4	\$1,467	\$44,010
1' below	\$2,899	\$1,724	\$30	\$4	\$4,657	\$139,710
5' below	\$7,689	\$3,618	\$30	\$4	\$11,341	\$340,230
8' below	\$21,990	\$8,218	\$30	\$4	\$30,242	\$907,460

*May 1, 2007 Rate Tables



Important

Information

NOTE: Building owners will save insurance money if they elevate above BFE. But more impressive is how the cost of insurance can more than triple if the building is only one foot below BFE.

REMEMBER!

A community may be able to grant a variance, but the owner will probably still be required to buy flood insurance. Imagine trying to sell a house if the bank requires insurance that costs over \$4,600 a year!

Want to Learn More?

- For information and advice on permits and managing flood hazards, contact the NFIP State Coordinator at 1-785-296-5440 or visit the Kansas Department of Agriculture, Division of Water Resources, Floodplain Program website at <http://www.ksda.gov>.
- For information about flood reduction programs, call the State Hazard Mitigation Officer at 785-274-1421.
- To order FEMA flood maps, learn more about flood maps, and the Status of Map Change Requests call FEMA's Map Service Center at 1-800-358-9616 or order online at <http://www.msc.fema.gov/>.
- FEMA's on-line publications can be found in the FEMA Virtual Library. Many are posted in the Portable Document Format (PDF). Go to <http://www.fema.gov/library/> for more information. You can order printed copies of FEMA publications from FEMA Publications at 1-800-480-2520.
- To learn about flood insurance, call your insurance agent. Most insurance companies can write an NFIP policy for you. Call the National Flood Insurance Program's toll free number, 1-888-356-6329, to get the name of an agent in your area who writes flood insurance.

This *Quick Guide* may be downloaded from the Kansas Department of Agriculture Website at:

<http://www.ksda.gov/structures/content/196/cid/1365>